

U.S. Patent Applicant No. 09/808,299
Amendment dated February 11, 2005
Reply to Office Action of November 22, 2004

PATENT
Attorney Docket 713-11-PA

Amendments to the Claims:

The following listing of claims replaces all previous versions and listings of the claims in this application:

Listing of the Claims:

Claims 1-44: (canceled)

45. (currently amended) A vortex-induced vibration (VIV) reduction mechanism for a substantially cylindrical structure for reduction of the effects of vortex-induced vibration (VIV) in the structure when the structure is submerged in flowing fluid, the mechanism comprising:

a plurality of columnar segments disposed around the exterior surface of the structure in a vertically stacked arrangement, each of the segments having a vortex-shedding surface discontinuity provided by a notch formed by a radially inward-directed wall thickness discontinuity of the segment and oriented substantially parallel to the axis of the structure, the segments being arranged with respect to each other so that the surface discontinuity of each segment is circumferentially displaced from the surface discontinuity of an adjacent segment, whereby the surface discontinuities of the plurality of segments define a discontinuous, stepwise, approximately helical pattern of vortex-shedding discontinuities along the length of the structure, wherein each of the columnar segments has at least two vortex-shedding surface discontinuities equidistantly spaced around the exterior surface of the columnar segment, and wherein each columnar segment has a radius that varies continuously in length between each two successive vortex-shedding surface discontinuities.

46. (previously presented) The mechanism of claim 60, wherein each of the surface discontinuities is a notch.

U.S. Patent Applicant No. 09/808,299
Amendment dated February 11, 2005
Reply to Office Action of November 22, 2004

PATENT

Attorney Docket 713-11-PA

47. (previously presented) The mechanism of claim 60, wherein each of the surface discontinuities is a projection.

Claims 48-59: (canceled)

60. (currently amended) A vortex-induced vibration (VIV) reduction mechanism for a substantially cylindrical structure for reduction of the effects of vortex-induced vibration (VIV) in the structure when the structure is submerged in flowing fluid, the mechanism comprising:

a plurality of columnar segments disposed around the exterior surface of the structure in a vertically stacked arrangement, each of the segments having at least two vortex-shedding surface discontinuities equidistantly spaced around the exterior surface of the columnar segment and oriented substantially parallel to the axis of the structure, wherein each columnar segment has a radius that varies continuously in length between each two successive surface discontinuities, the segments being arranged with respect to each other so that the surface discontinuities of each segment are circumferentially displaced from the surface discontinuities of an adjacent segment, whereby the surface discontinuities of the plurality of segments define a discontinuous, stepwise, approximately helical pattern of vortex-shedding discontinuities along the length of the structure.

61. (new) A vortex-induced vibration (VIV) reduction mechanism for a substantially cylindrical structure for reduction of the effects of vortex-induced vibration (VIV) in the structure when the structure is submerged in flowing fluid, the mechanism comprising:

a plurality of columnar segments disposed around the exterior surface of the structure in a vertically stacked arrangement, each of the segments having a vortex-shedding surface discontinuity provided by a notch formed by a radially inward-directed wall thickness discontinuity of the segment and oriented substantially parallel to the axis of the structure, the segments being arranged with respect to each other so that the surface discontinuity of each segment is circumferentially displaced from the surface discontinuity of an adjacent segment,

U.S. Patent Applicant No. 09/808,299
Amendment dated February 11, 2005
Reply to Office Action of November 22, 2004

PATENT

Attorney Docket 713-11-PA

whereby the surface discontinuities of the plurality of segments define a discontinuous, stepwise, approximately helical pattern of vortex-shedding discontinuities along the length of the structure, wherein each columnar segment has a central axis, and wherein the notch in each segment has a first flat surface that is radially aligned with the central axis and a second flat surface that is perpendicular to the first flat surface.